

**PAN AFRICA CHRISTIAN UNIVERSITY
EXAMINATIONS PAPER**



PAN AFRICA CHRISTIAN UNIVERSIT

BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

END OF SEMESTER EXAMINATION

DEPARTMENT: COMPUTING AND INFORMATION TECHNOLOGY

COURSE CODE: BIT/BICT 404

COURSE TITLE: MOBILE AND WIRELESS NETWORKS

EXAM DATE: APRIL, 2023

TIME:

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other Three questions in Section **B**.
- Write only your **student number** on the answer booklet provided.
- None programmable calculator permitted
- Calculators on phones, tablets and computers are NOT permitted in Theory Papers

SECTION A

(Answer ALL questions in this section)

QUESTION ONE

- a) Explain why encapsulation and decapsulation is needed in the context of mobile IP
[3 Marks]
- b) Outline any **TWO** major steps used by the Mobile Stations(MSs) outside their own
subscription areas
[2 Marks]

- c) Explain why the traditional IP cannot be used in a mobile network **[3 Marks]**
- d) Given the CSMA/CD technique, the sender starts to transmit if it senses the channel to be free. Explain why even if it senses the channel to be free, there can be a collision

[2 Marks]

SECTION B (Answer Any Three (3) Questions)

QUESTION TWO

- a) Describe any **FOUR** design goals which have to be achieved while designing WLANs **[8 Marks]**
- b) Summarize the reasons as to why the MAC protocol designed for infrastructure based wireless may not work satisfactory in infrastructure **[2 Marks]**

QUESTION THREE

- a) In order to save costs, an Internet Service Provider (ISP) hosts both the website and the database of a company on the same web server. Discuss the **TWO** disadvantage of this decision from a security point of view. **[4 Marks]**
- b) Identify any **TWO** limitations of Global Positioning Systems in mobile and wireless networks **[2 Marks]**
- c) Aisha is the Network Administrator of Keen Networks. She has realized this morning that the network is unusable. On further tests, she recognizes that an authorized user has gained access to their network connection. Amon is to write a report after curtailing the attack on his company's intranet. Explain **TWO** causes the problem that lasted for a whole day. **[4 Marks]**

QUESTION FOUR

a) Identify any **THREE** essential services that might depend on the actual location and wireless network [3 Marks]

b) Giving suitable examples analyze **THREE** main phases of Temporary Ordered Routing Algorithm (TORA) as used in mobile and wireless networks [7 Marks]

QUESTION FIVE

a) Suppose the antenna elements of the receiver are separated by a fraction of the transmitted wavelength, then the various copies of the information signal or generically termed as branches, can be combined suitably or the strongest of them can be chosen as the received signal. Discuss any **THREE** diversity techniques used in such cases of the information signal [6 Marks]

b) With clear examples discuss any **TWO** specific application of an ad hoc networks [4 Marks]

QUESTION SIX

a) Network initial installation costs are roof top and not easily achievable by small enterprises. Network service affordability is simply making the right financial decisions for your customer. Discuss **THREE** factors that those decisions will depend on.

[6 Marks]

b) Discuss **TWO** types of multiple access techniques that determines the availability of bandwidth and allocation of users [4 Marks]